DOCUMENT RESUME

ED 082 921 RC 007 395

AUTHOR Rillo, Thomas J.
TITLE Teacher Techniques: Exploring Timber Cruising.
PUB DATE 70
NOTE 3p.

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS Economic Factors; *Forestry Occupations; Management; *Measurement Instruments; *Outdoor Education; *Teaching Techniques; *Trees

ABSTRACT

A timber cruise is an estimate of the timber in a stand to see what kinds of trees are growing, how many are marketable, and whether good forest management practices are followed. The objectives of timber cruising are to secure information to recommend good management practices to the land owner and to determine the commercial value of the trees. Timber cruising is a technique which can be used by classroom teachers in outdoor teaching. The class is divided into small teams and assigned to a specific segment of the stand. Two of the tools required, the Biltmore stick and the hypsometer, can be requested from the U. S. Forest Service. Other tools needed include a yardstick, a pacing course, a forester's chain, a diameter tape, a Merritt hypsometer, a volume table, and a tally sheet. Directions for using the Biltmore stick and the hypsometer are given in this paper. (PS)

FILMED FROM BEST AVAILABLE COPY

ED 082921

Outdoor Education

Dr. Thomas J. Rillo

RECEIVED NOV 30 1973 NMSU E.R.I.C.

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

TEACHER TECHNIQUES

"Exploring Timber Cruising"

Thomas J. Rillo

1970

> Every farm woodland, in addition to yielding lumber, fuel and posts, should provide its owner a liberal education. This crop of wisdom never fails, but it is not always harvested.
> --Aldo Leopold, in A Sand County Almanac

By definition, a timber cruise is an estimate of the timber in order to see what kinds of trees are growing, how many are marketable, and whether or not good forest management practices are followed. The procedure known as timber cruising may have widely different objectives. Some of the more common objectives are:

1. To secure preliminary information concerning the stand of timber in order to recommend good management practices to the land owner.

2. To obtain necessary information which will assist in the determination of the commercial value of the trees in the stand of timber.

Although timber cruising is primarily employed by forest management personnel, it is also a technique which can be utilized by classroom teachers in their outdoor teaching. More specifically, timber cruising can be used in the curricular enrichment of the disciplines of math, science, and social studies. There are basic concepts in each of these disciplines, at most grade levels, which can be correlated with this outdoor activity. The cruise should always fulfill the requirements of some definite aim and objective. When used with a school group the aim and objective should be curricular in nature.

Trees play a vital role in conditioning the life of man. The value of trees for beauty and shade cannot fully be measured. The wood that comes from these trees can be measured and is one of the most important materials in the world.

Usually lumber is sold by the board foot. A board foot is a piece of lumber 12 inches long, 12 inches wide and 1 inch thick. Important to a school group undertaking this outdoor activity will be the determination of usable board feet in a tree and the price per board foot of a particular tree species at the sawmill. In accomplishing this task of measurement, the students will apply many previously learned mathematics and science concepts.

It is advisable to divide the class into small teams of two to four students each. Each small group is assigned a specific segment of the timber stand to cruise. A preliminary step would be to have each team develop a map of their area and to plot the trees on it that are marketable. Usually 1/5 of an acre would be a large enough tract for a small team to cruise in one-half to a full day.

RC 007395

The tools required for timber cruising need not be expensive. In fact, much of the equipment can be homemade or classmade. An important tool is a Biltmore stick or cruise stick. This device is a tool which is used to measure the diameter of a tree and oftentimes includes, on the opposite side, a hypsometer which measures 16-foot sawlogs. Both of these measurement devices can be requested from the U. S. Forest Service and will be in paper form. These strips of paper can be mounted by the students on a one-inch wide wooden lath. A shellac or clear varnish painted over both the paper and the lath will help to insure its longevity.

A yardstick would be very useful in the determination of the length of an individual's pace (2 normal strides to a pace). Many hardware stores will donate an adequate supply of yardsticks as a matter of advertisement. A pacing course would also be employed in the determination of pace. Two stakes can be driven into the ground 100 feet apart. Each individual walks the length of the course and back again to the starting point. The average length of a pace can be determined by dividing the total number of paces into total footage (100 ft.)

Another useful tool is the forester's chain. This device is used for measuring land distances. One full chain length is equal to 66 feet. Homemade chains can be made from wire coat hangers, cut into short lengths, and chained together as links. The chain could also be fashioned from an ordinary clothes line. Plastic lines are better because they will not stretch when wet. One acre of land is represented by an area one chain length wide by ten chain lengths long. The chain is useful in finding the size of 1/5 of an acre assigned to each study team.

A diameter tape is another measuring device that indicates the diameter of the tree by measuring the circumference. Diameters of trees are always measured at diameter at breast height (d.b.h.). With adults this is taken at a height $4\frac{1}{2}$ feet above ground level. With students it is not always possible to adhere to this height because youngsters are much shorter than adults.

A homemade diameter tape can be made by taking a cloth tailor's tape and marking ink lines every 3.14 inches along the full length of a 6-foot tape. These consecutive marks should be further labeled as 1-inch diameter, 2-inch diameter, 3-inch diameter, etc. When using the tape, the diameter of the tree will be the inch mark (in ink) nearest to where the tape overlaps the zero end of the tape.

A Merritt hypsometer is a tool used to measure the number of sawlogs (16 feet) in a tree. Measuring a tree for marketable timber will involve determining the height of the tree in 16-foot sawlog lengths. The top of the straight tree smaller than 8 inches in diameter cannot be used for lumber.

A yardstick can be used to make a homemade hypsometer. Starting at one end of the yardstick, proceed to make notches 6.15 inches apart with a knife. Instead of notches, marks can also be made with pen and ink or a woodburning set. Each mark represents one sawlog length.

The above listed tools are all that is needed to measure the board feet in a tree. A volume table usually appears on the Biltmore stick paper form requested from the U. S. Forest Service.

A tally sheet is used to record diameters and numbers of sawlogs in trees. It should include the following headings: tree number, species, d.b.h., number of sawlogs, volume per board foot and condition of the tree. The tally sheet can be made in class and can appear in a notebook so that the student can carry it in his pocket to record the trees as he measures them.

How to Use the Biltmore Stick and Hypsometer

1. Hold Biltmore stick horizontally at arm's length (23-25 inches) against tree at breast height ($4\frac{1}{2}$ feet above ground); line up zero end with the outside of the tree.

2. Without moving head, look at the other side of tree trunk and read the figure nearest to where your line of sight crosses the stick and the edge of the tree. Record this diameter on tally sheet.

3. Pace 66 feet away from the base of the tree. Forester's chain may be used if more accuracy is desired.

4. Face the tree and put arm out horizontally and hold the stick vertically with hypsometer side facing you. Bottom of stick should be in line of sight with the eye and base of tree. Without moving head, sight to marketable height of tree (estimate where the tree in 8 inches in diameter). The number nearest to where line of sight crosses hypsometer stick is the number of 16 foot sawlogs in the tree.

5. Use volume table to determine number of board feet in tree. Find tree diameter in left hand column labeled d.b.h. inches of tree measured. Find column across the top with the number of sawlogs measured. Read the number in the table where the diameter figure measured intersects with the number of sawlogs obtained. This is the number of board feet in the tree.

6. Multiply number of board feet by the price per board foot delivered at the sawmill. This will be the commercial value of the tree.

7. The Master Tree Finder by May Thielgaard Watts is an excellent key to use in determining the species of the tree. Price - $ .50. Address - Nature Study Guild Publishers, P. O. Box 53, Naperville, Illinois, or P. O. Box 972, Berkeley, California.

Timber cruising can by both fun and an excellent learning experience. Go to a wooded area with your class and your homemade Biltmore stick, Merritt hypsometer, diameter tape, volume table and tally sheet. Give the students an opportunity to apply what they have learned in your classroom to the problem solving aspects of cruising a timber stand.